

broadly rounded, half the width of the apex, which is slightly rounded inwardly; the bordering keel is shining, flat, smooth, broad at the base; the apex is broadly depressed, finely rugosely punctured, the rest irregularly punctured and aciculated.

XXII.—*On the Black-and-tan Pattern of Domestic Dogs* (*Canis familiaris*). By R. I. POCK, F.L.S., F.Z.S., Superintendent of the Zoological Society's Gardens.

IN 'The Variation of Animals and Plants under Domestication,' pp. 33-35 (ed. 1905), the black-and-tan pattern of domestic dogs is discussed at some length. Darwin was led to investigate the question somewhat fully in the hope that he might thereby discover a clue to the origin of our breeds amongst wild species; but failing to find the tan-coloured spots over the eyes either depicted in any drawings of wolves, jackals, and other species of *Canis*, or visible on any skins in the collection of the British Museum, he came to the conclusion that the coexistence of these spots with tan-coloured paws is probably a case of correlated variation.

Apart from suggesting that a now extinct species involved in the pedigree of domestic dogs may have possessed these spots, he offered no other explanation of the "highly remarkable" fact of the occurrence of these spots in "extremely different breeds, living in various parts of the world."

The phenomenon, however, appears to me to be susceptible of a quite simple explanation.

In a typical black-and-tan dog, whatever the breed, the tan is distributed as follows:—on the sides of the muzzle and lips, the lower half of the cheeks, and the throat; a spot over the inner corner of the eye, very frequently on the inside of the ear, and as a large patch on each side of the chest above the base of the fore legs; on the paws of the fore legs and on the hind legs below the hock; to a somewhat variable degree on the inner sides of the legs, but extending over the front of the hind leg up to the body; on the circumanal area and on the underside of the tail, at least in its proximal portion. The rest of the animal is black. If a dog thus coloured be compared with many of the common wild species of *Canidæ*, it will be seen that the tan occurs over areas which in the wild species are paler than the rest of the body, owing to the fading or absence of the black annuli which prevail in the

hair elsewhere, and that the black corresponds to the darker portions of the body, where the hair is richly pigmented, in the wild animals. This statement only needs qualification with respect to the tan spots over the eyes, the homologues of which are by no means always visible in wild dogs, or, at all events, are not sufficiently evident to carry absolute conviction as to their presence. This is the case with examples of the following species now living in the Zoological Gardens:—*Canis latrans*, *anthus*, *lupaster*, *aureus*, and *mesomelas**; *Cuon dukhunensis* and *alpinus*. On the other hand they are detectable, though minute, in some examples of *Vulpes vulpes*, and visible, though not conspicuous, in two Dingos which I have reason to think have a mongrel strain of domestic dog. In the case, however, of the wolves now or lately living in the Gardens, namely in a Siberian example of *C. lupus*, in three specimens of *C. lupus occidentalis*, and in one of *C. pallipes*, there is no possibility of overlooking them. Although not emphasized by a setting of jet-black hair, they nevertheless show up as pale spots relatively as large as the corresponding tan spots in dogs. Their conspicuousness in these species suggests, though it does not prove, a preponderance of the wolf strain over that of jackals in our breeds of domestic dogs.

Black-and-tan dogs may be termed melaneseent, or, preferably, nigrescent sports. Were they completely melanistic or perfect "melanos" they would be black all over, as many dogs are. It is evident that the tan stands in the same relation to the pale areas as the black does to the more heavily pigmented areas of the wild species; and it is a highly interesting fact that the nigrescent sport throws back to the type of pattern characteristic of a parent form. Tan is merely one of the shades of that class of colour which is commonly called "erythrismic"; and, assuming the truth of the above-given explanation of the occurrence of tan in dogs, it appears that albinism, erythrism, and melanism are three consecutive stages in colour-variation, erythrism being the incipient stage either of albinism or melanism, according as the organism is albescent or nigrescent—that is to say, assuming or tending to assume the albino or melano livery.

I believe this "law" of colour-change will prove to be capable of wide application in the Mammalia and probably outside the limits of that class. For example, there are in the Zoological Gardens at the present time some black-and-tan mouflon (*Ovis musimon*). In these animals the white portions of the typical wild sheep are tan and the rest of the coat

* This is not strictly true of all examples of this species.

heavily suffused with black, exactly as in the case of black-and-tan dogs. They are intermediate in colour between a typical mouflon and a completely melanistic sport of that species; and, be it noted, they commonly produce perfectly black lambs. They furnish an instance of the tan being the halfway stage between white and black in organisms assuming a black pelage.

Conversely, as examples of the tan or red being the intermediate stage between the normal and the albino sport, may be cited yellow or "ginger" varieties of domestic cats, which frequently at all events, and perhaps always, have the pads of the feet pink instead of black; and also red-haired blue-eyed types of some Jews, whose colour Prof. Haddon speaks of as a kind of minor albinism. In support of this I may add that in the 'Sketch' for Nov. 14th, 1906, there was a photograph of a Kaffir reported to have had a white skin, pale blue eyes, and short, woolly, yellow hair. It is well known that some wholly white, or partially white cats like Siamese have blue eyes. Hence the blueness of the iris appears to be a sign of albescence both in the human and the feline species.

XXIII.—*Seminula*: a Note by
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In the Ann. & Mag. Nat. Hist. ser. 7, vol. xviii., Nov. 1906, pp. 321-327, Mr. S. S. Buckman, F.G.S. questions the accepted use of certain Carboniferous generic names and suggests somewhat drastic alterations.

He has, in the case of *Seminula*, drawn attention to as pretty a tangle as palæontologists have ever made, and I have to acknowledge his very courteous aid in my attempt to unravel it.

I shall content myself with the statement of the results which I have obtained from a careful examination of specimens and figures at the British Museum, and, in this work, I am under a pleasant sense of obligation to Dr. F. A. Bather and Mr. C. D. Sherborn. The question of priority in names must be left to experts in nomenclature.

SEMINULA.

The genotype is stated by Mr. Buckman to be *Terebratula pentaëdra*, Phill., and in this opinion he has the support of Hall & Clarke and Schuchert. It is only necessary, therefore, to discover to what genus this species belongs.